

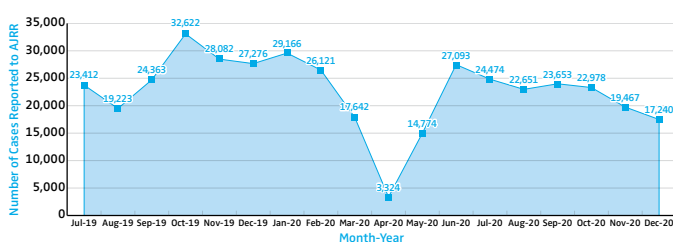
2021 AJRR Annual Report Preview

2021 AJRR Annual Report Highlights

Impact of COVID-19

The COVID-19 pandemic resulted in widespread disruption to the delivery of joint replacement care. However, as a testament to the commitment and resiliency of healthcare institutions, clinicians, and patients, reported procedures appeared to rebound to average procedural volume by June of 2020, only two months following the maximal impact of the pandemic, as indicated in Figure 1.1. Despite the COVID-19 pandemic, the *2021 Annual Report* includes 2,244,587 hip and knee procedures, an overall cumulative procedural volume growth of 18.3% compared to the *2020 Annual Report*.

Figure 1.1 Hospital Case Volume by Month, Jul 2019-Dec 2020



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AJRR is the Official Registry of the American Association of Hip and Knee Surgeons (AAHKS)

Implant Specific Revision Rates

The ability to look at revision rates for particular implants is one of the great strengths of the American Joint Replacement Registry (AJRR). Results showed all hip device constructs included in analysis have a cumulative percent revision of less than 2.8% at one year and less than 4.7% at final follow-up for each respective device. All TKA device constructs included in analysis have a cumulative percent revision of less than 2.5% at three years and less than 3.7% at final follow-up for each respective device. An example of information contained in the *Annual Report* is provided below.

Table 2.5 Cumulative Percent Revision of Cementless Acetabular Components in Hip Arthroplasty Constructs, 2012-2019

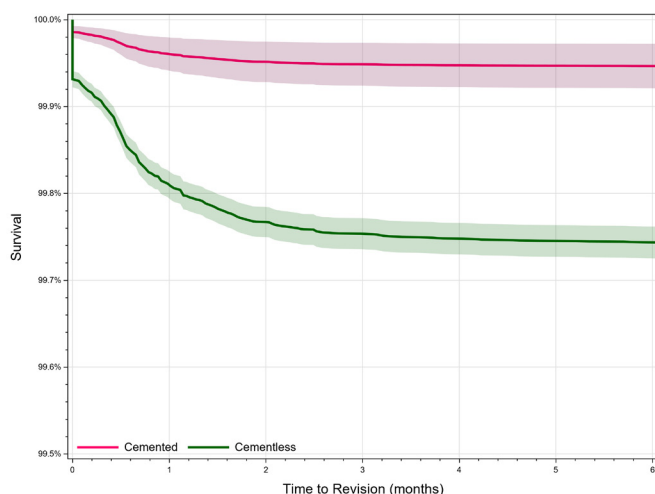
Acetabular Shell	N Total	N Revised	1 Yr	3 Yrs	5 Yrs	7 Yrs
Pinnacle	84,033	1,044	0.95 (0.89, 1.02)	1.30 (1.22, 1.39)	1.55 (1.45, 1.66)	1.72 (1.56, 1.90)
Trident	51,036	1,062	1.48 (1.37, 1.58)	2.09 (1.96, 2.23)	2.45 (2.30, 2.62)	2.88 (2.60, 3.17)
R3	24,887	464	1.54 (1.39, 1.70)	2.00 (1.82, 2.19)	2.20 (1.99, 2.43)	2.41 (2.10, 2.75)
G7	23,353	335	1.31 (1.17, 1.47)	1.63 (1.46, 1.82)	1.76 (1.54, 2.00)	—
Continuum	21,696	502	1.78 (1.61, 1.97)	2.33 (2.13, 2.55)	2.65 (2.41, 2.90)	2.87 (2.57, 3.19)
Trident II	8,998	101	1.29 (1.05, 1.57)	1.36 (1.10, 1.67)	—	—
Trilogy	7,379	174	1.49 (1.23, 1.79)	2.05 (1.74, 2.41)	2.69 (2.29, 3.14)	3.17 (2.61, 3.82)
Trabecular Metal	4,456	106	1.82 (1.45, 2.24)	2.19 (1.78, 2.66)	2.74 (2.22, 3.36)	3.36 (2.44, 4.52)
FMP	2,937	31	0.91 (0.61, 1.31)	1.14 (0.78, 1.63)	1.45 (0.85, 2.34)	—
Restoration ADM	2,702	48	1.35 (0.96, 1.84)	1.80 (1.34, 2.38)	1.96 (1.45, 2.58)	1.96 (1.45, 2.58)
Mallory Head	1,873	21	0.75 (0.43, 1.24)	1.14 (0.72, 1.74)	1.26 (0.79, 1.90)	1.26 (0.79, 1.90)
RingLoc+	1,617	35	1.49 (0.99, 2.18)	1.95 (1.35, 2.72)	2.17 (1.53, 2.99)	2.51 (1.66, 3.62)
Novation	1,538	27	1.46 (0.95, 2.17)	2.16 (1.39, 3.21)	2.16 (1.39, 3.21)	2.16 (1.39, 3.21)
Dynasty BioFoam	1,434	40	1.98 (1.35, 2.81)	2.69 (1.92, 3.67)	3.11 (2.23, 4.23)	3.52 (2.40, 4.95)
Regenerex RingLoc+	1,251	29	1.62 (1.02, 2.45)	2.16 (1.43, 3.13)	2.90 (1.92, 4.20)	2.90 (1.92, 4.20)
Escalade Acetabular System	1,149	8	0.53 (0.22, 1.10)	0.62 (0.28, 1.24)	0.80 (0.37, 1.55)	—
Trinity	1,010	17	1.44 (0.83, 2.36)	1.94 (1.16, 3.07)	1.94 (1.16, 3.07)	1.94 (1.16, 3.07)
Versafitcup DM	964	19	1.56 (0.91, 2.50)	1.89 (1.16, 2.91)	2.08 (1.28, 3.18)	2.08 (1.28, 3.18)
Interface Acetabular System	826	17	1.34 (0.71, 2.32)	1.91 (1.12, 3.06)	2.57 (1.47, 4.17)	—
Ranawat-Burnstein	841	20	2.03 (1.23, 3.16)	2.35 (1.46, 3.59)	2.70 (1.65, 4.16)	2.70 (1.65, 4.16)

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Hip Arthroplasty Preview

The *AJRR Annual Report* contains various analyses of the current practice of total hip arthroplasty. New for this year, diagnosis-specific causes for revision were included. One example of such an analysis is included below, in Figure 2.28. Adjusting for age and gender, cemented fixation showed a statistically significant reduction in early revision due to periprosthetic fracture compared to cementless fixation in elective primary THA patients ≥ 65 years of age (HR: 0.208, 95% CI, 0.127-0.341, $p < 0.0001$).

Figure 2.28 Percent Survival for Revision due to Periprosthetic Fracture for Elective Primary Total Hip Arthroplasty ≥ 65 Years of Age Adjusted for Age and Gender, 2012-2020

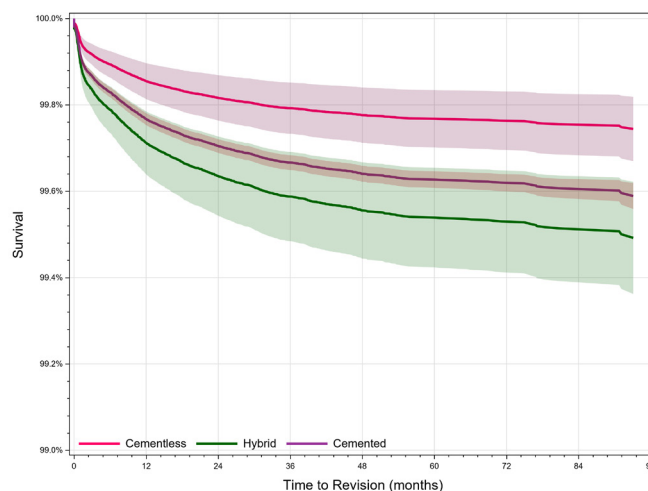


Age/Gender Adjusted Hazard Ratio (95% CI)
Cemented vs. Cementless: 0.208 (0.127-0.341) $p < 0.0001$

Knee Arthroplasty Preview

The *AJRR Annual Report* also contains several new analyses regarding total knee arthroplasty. The example below (Figure 3.16) depicts survivorship of primary total knee arthroplasty based on fixation when looking at the end point of revision for infection. Interestingly, cementless fixation was associated with significantly less revision due to infection in elective primary TKA in patients ≥ 65 years of age, although potential confounders of patient health and surgical time could not be examined. (HR=0.622, 95% CI, 0.465-0.831, $p = 0.0013$).

Figure 3.16 Percent Survival for Revision due to Infection for Elective Primary Total Knee Arthroplasty ≥ 65 Years of Age Adjusted for Age and Gender, 2012-2020



Age/Gender Adjusted Hazard Ratio (95% CI)
Cementless vs. Cemented: 0.622 (0.465-0.831) $p = 0.0013$
Hybrid vs. Cemented: 1.237 (0.957-1.598) $p = 0.1037$

Patient-Reported Outcomes

The AJRR collects patient reported outcomes. This information has great potential for research into the practice of joint replacement. KOOS, JR. data for primary total knee arthroplasty is depicted below as an example.

Table 3.8 Change Between Preoperative and 1-Year Postoperative PROM Scores after Primary Knee Arthroplasty by PROM, 2012-2020

Patient-Reported Outcome Measure (PROM)	PROM Component	Patients with Preoperative Score	Patients with Linked Postoperative Score	Response Rate, Percentage of Patients Who Completed a Preoperative and 1-Year Score	Patients with Meaningful Improvement*
KOOS, JR. (Knee disability and Osteoarthritis Outcome Score)	Score	55,016	14,127	25.7%	87.9%
PROMIS-10 (Patient-Reported Outcomes Measurement Information System 10)	Mental T	37,943	10,415	27.5%	33.8%
	Physical T	37,943	10,415	27.5%	67.8%
VR-12 (The Veterans RAND 12 Item Health Survey)	Mental Health Component	20,416	5,574	27.3%	33.7%
	Physical Health Component	20,213	5,581	27.6%	74.8%

*Meaningful improvement was calculated by minimal clinical important difference (MCID). MCID was determined to be a positive change score of half the pooled standard deviation